



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,765	06/06/2005	Masahiro Furukawa	124195	5453

25944 7590 08/22/2007
OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

ROBINSON, LAUREN E

ART UNIT	PAPER NUMBER
----------	--------------

1709

MAIL DATE	DELIVERY MODE
-----------	---------------

08/22/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/537,765

Applicant(s)

FURUKAWA ET AL.

Examiner

Lauren E.T. Robinson

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3 June 2005, 6 June 2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being unclear with regard to the oxide of aluminum being dialuminum trioxide wherein the oxide phase including the dialuminum trioxide in an amount of 5.0 to 50.0 mole% of the entire oxide phase. Although, the applicants' disclose in their specification that the dialuminum trioxide is in the amount of 5.0 to 50.0 mol% of the entire oxide phase, the claim reads as if the oxide phase as well as the dialuminum trioxide are in the amount of 5.0 to 50.0 mole% of the oxide phase which is considered to be impossible.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 1709

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-16 are rejected under 35 U.S.C. 103(a) as being obvious over Tabuchi et. al. (WO 2003/082770) published October 10, 2003.

Tabuchi et. al. teach a silicon carbide-based porous material comprising silicon carbide particles as an aggregate, metallic silicon as a bonding material and an oxide phase containing Si, Al, and an alkaline earth metal (abstract). The said oxide phase is comprises silicon dioxide, dialuminum trioxide, and an alkaline earth metal from the group consisting of Mg, Ca, Sr, and Ba (claim 4). The oxide phase is located on the surface of the silicon carbide particles and/or the metallic silicon (claims 1 and 7) and in at least part of each pore. The oxide phase in this reference is made up of at least one kind of structure selected from the group consisting of cordierite ($\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$), anorthite, Sr feldspar, and celsian (claim 8). Due to dialuminum trioxide (Al_2O_3) being included in the said cordierite structure, this crystal structure taught by the reference is equivalent to applicants' claims 13 and 14. In this instance, the said crystal phase also containing the alkaline earth metal does not need to be of substantial amount within the said oxide phase.

Tabuchi et. al. also teach the alkaline metal in terms of monoxide in the crystal structure cordierite to be 9 to 50 mass% of the total oxide phase (Pg. 3, Col. 1, Par 0034). Since the dialuminum trioxide is also within this structure, it would have been obvious to one having ordinary skill in the art at time the invention was made to modify

Art Unit: 1709

the mass% of alkaline metal monoxide in Tabuchi et. al.'s to fit the percentage range of applicants' said dialuminum trioxide (5 to 50.0 mol% of the oxide phase). Due to the percentage ranges being 9 to 50% by mass alkaline earth metal monoxide of the oxide phase and 5 to 50 mol% dialuminum trioxide of the oxide phase, it would be inevitable that these percentages would overlap for the oxide phase structure to reach 100%.

While the alkaline earth metal monoxide in this example is MgO, Tabuchi et. al. discloses a preferred alkaline earth metal monoxide should be chosen from the group consisting of MgO, CaO, SrO, and BaO (Pg. 2, Col.1, Par. 0020).

Regarding claim 14, the honeycomb structure in Claim 9 of the reference's disclosure states that a honeycomb structure is characterized by being constituted by a silicon carbide-based porous material comprised of silicon carbide particles as an aggregate, metallic silicon and an oxide phase containing Si, Al and an alkaline earth metal. Tabuchi et. al also teach that the honeycomb structure is constituted by any of the above mentioned silicon carbide porous materials as discussed above (Pg. 3, Col. 2, Par. 0039).

Tabuchi et. al. also teach a method of making the silicon carbide porous body by adding, to a mixed raw material containing silicon carbide particles and metallic silicon, inorganic microballoons containing Si and Al and a compound containing an alkaline earth metal, forming the resulting mixture into a formed material of intended shape, and calcinating and firing the formed material to melt the inorganic microballoons (Pg. 2, Col. 1, Par. 4). This is done to obtain a porous material of porous structure wherein an oxide phase containing Si, Al and an alkaline earth metal is on surfaces of and/or at

Art Unit: 1709

the silicon carbide particles and/or the metallic silicon. As mentioned above, an oxide phase including dialuminum trioxide (Al_2O_3) and an alkaline earth metal in a crystal structure (cordierite) is also present wherein the alkaline earth metal is 9 to 50 mass% of the total oxide phase. While the materials in this reference were silent with regard to the dialuminum trioxide amount within the oxide phase, the obviousness to modify the reference's amount to fit the applicants' material as previously mentioned would then constitute the reference's honeycomb structure. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the honeycomb structure in Tabuchi et. al.'s teaching with the modified silicon carbide porous material containing the 5 to 50 mol% dialuminum trioxide of the oxide phase.

3. Applicant cannot rely upon the foreign priority papers to overcome the above rejections because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory

Art Unit: 1709

obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 9-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9 of copending Application No. 10/508656 US Publication 2005/0158534. Although the conflicting claims are not identical, they are not patentably distinct from each other because the

Art Unit: 1709

silicon carbide porous body claimed in the applicants' application is comprised of the same elements that are disclosed in the applicants' copending application. The silicon carbide porous body claimed in both applications is comprised of silicon particles as an aggregate, metal silicon for bonding, and an oxide phase in at least part of each pore and on the surface of either the particles and/or metal silicon. The said oxide phase in both sets of claims includes a silicon dioxide, dialuminum trioxide, and either calcium oxide or strontium oxide. The said oxide phase is claimed to be a crystal phase including dialuminum trioxide and that crystal phase includes cordierite, anorthite, or strontium feldspar.

Claim 3 of the copending application discloses that the said oxide phase has a content of 9 to 50% by mass of the alkaline earth metal monoxide and claim 1 of the applicants' disclosure claims that the oxide phase has 5 to 50 mol% dialuminum trioxide. While the percentages claimed are to two different materials in the same structure, it would have been obvious to modify claim 3 of the copending application to fit the range of the applicants' disclosure because in a structure such as cordierite as previously mentioned, the ranges of both elements would overlap.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. Claims 9-15 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, and 11-12 of U.S. Patent No. 7244685. Although the conflicting claims are not identical, they are not patentably distinct from

Art Unit: 1709

each other because in Furukawa et. al's patented claim 1, a silicon carbide porous body comprising silicon carbide particles which are aggregates that are bonded together with metallic silicon forming pores between the said particles. Also, within the said porous body there is an amorphous oxide phase containing oxides of silicon, aluminum and strontium ($\text{SrO}:\text{Al}_2\text{O}_3:\text{SiO}_2$) in a ratio of (1.0:0.1:1.0) to (1.0:1.0:3.0) in terms of molar ratio. The oxide phase in this teaching is located in at least some of the pore portions in a minimum distance of 10 micrometers or less between the surfaces of the silicon particles. While the claim is not identical to the applicants' claims 9-14, they are not patentably distinct due to the strontium in the amorphous oxide phase in this reference being the applicants' said alkaline earth metal, the phase located within the pores but not necessarily stated that it is located on the surface of the particles in this reference, and the ratios in this claim being written differently than the applicants' claim 1.

Since the applicants claim in claim 10 that the oxide phase is provided on a surface of the silicon carbide particles and/or a surface of the metallic silicon and the reference claims that the phase has a distance of 10 micrometers or less between the surface of the silicon carbide particles or between the particles and metallic silicon, it is possible that the phase is located on the surface of the metallic silicon. The metallic silicon is considered the bonding material for this porous body meaning that this material is located in between each silicon carbide particle and if the patented claim 1 claims that the phase is 10 micrometers or less in between each particle, the phase is possibly present on the metallic silicon surface. While the ratios are written in a different manner in the patented claim 1 than in the applicants' pending claim 1, the applicants'

Art Unit: 1709

ratio range falls into the patented range. Rewritten in similar form would produce the patented porous body to have dialuminum trioxide occurring at an amount of 4.76 to 20 mol% of the oxide phase.

The honeycomb structure while claimed in claim 11 of Furukawa et. al.'s teaching merely states that it is comprised of the silicon carbide porous body as previously discussed. While the applicants claim 15 merely restates the said silicon carbide porous body in their previous claims, the reference honeycomb structure is in a dependent claim referring back to the equivalent structure. Although, they are written slightly differently, these honeycomb structures are one in the same.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lauren E.T. Robinson whose telephone number is (571) 270-3474. The examiner can normally be reached on Mon. through Fri. 7:30 to 5:00 EST (First Fri Off).

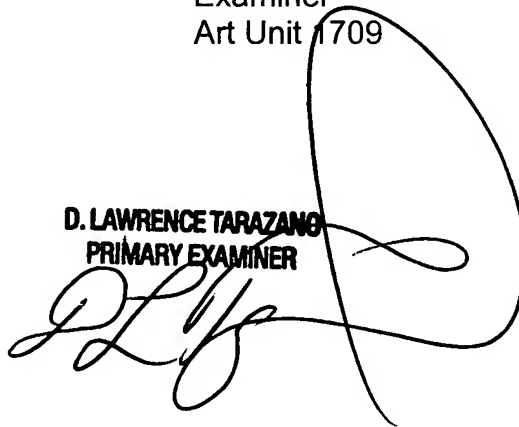
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1709

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Lauren E.T. Robinson
Examiner
Art Unit 1709

D. LAWRENCE TARAZANO
PRIMARY EXAMINER

A large, stylized handwritten signature in black ink, likely belonging to D. Lawrence Tarazano, is written over the printed name and title. The signature is fluid and cursive, with a large loop at the end.